

Synthesis of Results from the Social Security Number, Privacy Attitudes, and Notification Experiment

FINAL REPORT

This research paper reports the results of research and analysis undertaken by the U.S. Census Bureau. It is part of a broad program, the Census 2000 Testing, Experimentation, and Evaluation (TXE) Program, designed to assess Census 2000 and to inform 2010 Census planning. Findings from the Census 2000 TXE Program reports are integrated into topic reports that provide context and background for broader interpretation of results.

Susan Trentham and Laurie Larwood
University of Nevada, Reno

Kevin A. Shaw, Project Manager
Planning, Research, and Evaluation
Division

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Executive Summary

The Social Security Number, Privacy Attitudes, and Notification Experiment was a research project during Census 2000 that was developed to provide information for use in the planning of the 2010 census (Neugebauer, R. "Census 2000 Experimentation Program Master Plan: The Social Security Number, Privacy Attitudes, and Notification Experiment," Census Bureau, Planning and Evaluation Division, November 5, 1999). Obtaining Social Security Numbers from census respondents appeared to be consistent with the potential interest of expanding the Census Bureau's usage of administrative records information from other Federal agencies in future decennial censuses. The project was designed to assess the public's attitudes on privacy and confidentiality issues related to the notion of an "administrative records census" and to further examine how the notification of administrative records use and the request for a Social Security Number would impact census response rates and item nonresponse rates during Census 2000. The project included a survey and a panel component, enabling both attitudinal and behavioral responses to be evaluated.

The survey component (or Study of Privacy Attitudes in 2000) was conducted by The Gallup Organization and the Institute of Social Research at the University of Michigan. This component gathered information on public attitudes regarding the census, its uses, trust and privacy issues, the Census Bureau's confidentiality practices, possible data sharing across Federal agencies, and finally, the willingness to provide one's Social Security Number (Singer, E., Hoewyk, J., Tourangeau, R., Steiger, D., Montgomery, M., & Montgomery, R. "Final Report of the 1999-2000 Surveys of Privacy Attitudes," Census 2000 Testing and Experimentation Program, December 10, 2001). Telephone surveys were conducted with two different samples of U.S. household residents in 1999 and 2000, before and after Census Day 2000. The major analyses included: (a) comparisons of the responses to those of similar 1995 and 1996 public surveys commissioned by the Census Bureau to assess long-term attitudinal trends, (b) comparisons between 1999 and 2000 responses to examine any potential effects the *census environment* may have had upon public attitudes, and (c) the assessment of how self-reported census media exposure by 2000 survey respondents may have impacted their responses. Respondents' addresses were also obtained to examine how predictive respondents' attitudes were of their behavior of actually returning the Census 2000 form. Relationships between respondents' attitudes, demographic information, exposure to census publicity, and response behavior were subsequently determined.

The panel component consisted of two studies examining respondents' behavioral responses to actual Social Security Number requests and/or public notification of administrative record use. The Social Security Number-Notification study evaluated the effects of the Social Security Number request and the notification of administrative records use upon mail response rates and form completeness (Guarino, J.A., Hill, J.M., & Woltman, H.F. "Analysis of the Social Security Number Notification Component of the Social Security Number, Privacy Attitudes, and Notification Experiment," Census Bureau report, Testing and Experimentation Program, November 13, 2001). The Social Security Number-Validation study focused upon the accuracy of Social Security Numbers provided by respondents and examined the effect of the request and administrative records notification upon their validation rates (Brudvig, L. "Analysis of the Social Security Number - Validation Component of the Social Security Number, Privacy Attitudes, and

Notification Experiment,” Census 2000 Testing, Experimentation, and Evaluation Program, September 27, 2002). Both studies used data collected during Census 2000. Ten panels were designed with different experimental treatments (i.e., the additional Social Security Number request, the notification of administrative records use, or both). The experimental cover letters and forms were the official census forms received by the sampled households, in the standard sequence and timing (Brudvig, L. “Analysis of the Social Security Number - Validation Component of the Social Security Number, Privacy Attitudes, and Notification Experiment,” Census 2000 Testing, Experimentation, and Evaluation Program, September 27, 2002; Guarino, J.A., Hill, J.M., & Woltman, H.F. “Analysis of the Social Security Number Notification Component of the Social Security Number, Privacy Attitudes, and Notification Experiment,” Census Bureau report, Testing and Experimentation Program, November 13, 2001; Neugebauer, R. “Census 2000 Experimentation Program Master Plan: The Social Security Number, Privacy Attitudes, and Notification Experiment,” Census Bureau, Planning and Evaluation Division, November 5, 1999). All Social Security Number requests were voluntary.

In brief, the results of the **Survey of Privacy Attitudes in 2000** (Singer, E., Hoewyk, J., Tourangeau, R., Steiger, D., Montgomery, M., & Montgomery, R. “Final Report of the 1999-2000 Surveys of Privacy Attitudes,” Census 2000 Testing and Experimentation Program, December 10, 2001) indicated that:

- ▶ The public has steadily increased its knowledge and awareness of the census, its uses, and laws related to confidentiality practices between 1995 and 2000. The Census 2000 publicity seemed to enhance the public’s knowledge and endorsement to cooperate with the census.
- ▶ Long-term survey trends showed increases in the public’s belief that the Census Bureau *actually* protects data confidentiality; however no changes were shown in the public’s trust in the Census Bureau to keep data confidential between 1999 and 2000, suggesting no effect by the census publicity upon public attitudes related to confidentiality issues.
- ▶ General privacy concerns showed a very small, yet statistically significant, decline between 1999 and 2000; however long-term trends show small increases in public concerns about personal privacy and the loss of control over personal information. The proportion who viewed the census as an invasion of privacy did not change between 1999 and 2000.
- ▶ Trends revealed that increasing percentages express disapproval towards data sharing or providing one’s Social Security Number. Around forty-five percent in 1999 and 2000 stated that it would bother them “a lot” if their census information was shared – a significant increase from prior years. Expressed willingness to provide one’s Social Security Number declined from 68 percent in 1996 to 55 percent in 1999, with no change in 2000.
- ▶ Relationships were revealed between 2000 survey respondents’ attitudes and self-reported exposure to census-related media. Those exposed to both positive and negative media were more knowledgeable about the census, considered it more important, and were more likely to endorse an obligation to cooperate with the census than those with no media exposure.

The “*only negative exposure*” group had similar responses to those with both positive and negative media exposure, while more differences were shown between the “*only positive exposure*” group and those who reported exposure to both types of census-related media.

- ▶ Attitudes were shown to predict respondents’ behavior, with high privacy concerns, negative views on the Census Bureau’s confidentiality practices, disapproval of data sharing, and a lack of willingness to provide Social Security Numbers, being reliable negative predictors of whether respondents returned their Census 2000 forms and provided mailing addresses that could be used to determine the return status of their forms. Using reported demographics, nonwhite respondents were shown to be less likely to return their forms (Singer, E., Hoewyk, J., Tourangeau, R., Steiger, D., Montgomery, M., & Montgomery, R. “Final Report of the 1999-2000 Surveys of Privacy Attitudes,” Census 2000 Testing and Experimentation Program, December 10, 2001).

The **Social Security Number-Notification panel study** results (Guarino, J.A., Hill, J.M., & Woltman, H.F. “Analysis of the Social Security Number Notification Component of the Social Security Number, Privacy Attitudes, and Notification Experiment,” Census Bureau report, Testing and Experimentation Program, November 13, 2001) revealed that:

- ▶ The Social Security Number request for one or all household members decreased mail response rates, yet the decreases were smaller than expected. Specifically, results suggested that the Social Security Number request for all household members would decrease response by 2.1 percent in high census coverage areas and 2.7 percent in low census coverage areas compared to no request (Guarino, J.A., Hill, J.M., & Woltman, H.F. “Analysis of the Social Security Number Notification Component of the Social Security Number, Privacy Attitudes, and Notification Experiment,” Census Bureau report, Testing and Experimentation Program, November 13, 2001). The difference between the drop in response rates of the high and low coverage areas was not statistically significant.
- ▶ The Social Security Number request for all household members was associated with more missing data (or higher item nonresponse rates), yet there was no effect shown for Person 1.
- ▶ Taken together, specific and general notification of administrative record use *was* shown to decrease mail response. Separately, however, specific notification did not demonstrate the predicted stronger effects than the general notification. Furthermore, there was not sufficient evidence to conclude that notification further discouraged response in the presence of a Social Security Number request compared to notification alone.
- ▶ Notification was not shown to affect item nonresponse rates, whether the two notification types were grouped together or examined separately. Further, there were lower responses to the Social Security Number item for Person 1 when the request was made *without* notification (contrary to prediction). This occurred regardless of whose numbers were requested (Person 1 only versus all household members) and regardless of the notification type. Also, there were no individual effects upon form completeness by type of notification.

Finally, the **Social Security Number-Validation panel study** (Brudvig, L. “Analysis of the Social Security Number - Validation Component of the Social Security Number, Privacy Attitudes, and Notification Experiment,” Census 2000 Testing, Experimentation, and Evaluation Program, September 27, 2002) results showed that:

- ▶ There was a high degree of accuracy for the provided Social Security Numbers, with an overall match rate of 94.8 percent between the provided numbers and Census Numident file (provided by the Social Security Administration). Only 5.2 percent of the reported Social Security Numbers were considered invalid.
- ▶ The valid Social Security Number rates for high and low coverage areas revealed a small, but statistically significant, 2.4 percent difference between the accuracy rates of respondents’ reported numbers within the two coverage areas (high, 95.2 percent, and low, 92.8 percent).
- ▶ The valid Social Security Number rates for Person 1 were not affected by whether a Social Security Number request was made for Person 1 only or all household members. Person 1 valid rates were high across the panels (about 96-97 percent). Results also revealed patterns of decreasing validation rates for Person 2, Person 3, and so on through Person 6 among the panels that requested numbers for all household members. Nevertheless, their valid rates, were high with a range of over 95 percent to the lowest rate of 80.2 percent for Person 6.
- ▶ Notification of administrative records use had no effect upon the validation rates of provided Social Security Numbers for Person 1. Also, there were no differences between the valid rates of those who received the specific notification type versus the general notification type.

Based upon the findings of the three studies, the following recommendations are made:

- ▶ Design research that further explores public attitudes on privacy, confidentiality, and trust in the Census Bureau, and tests more effective ways to address these issues in future publicity efforts (Singer, E., Hoewyk, J., Tourangeau, R., Steiger, D., Montgomery, M., & Montgomery, R. “Final Report of the 1999-2000 Surveys of Privacy Attitudes,” Census 2000 Testing and Experimentation Program, December 10, 2001).
- ▶ Assess the potential impact of September 11, 2001 (and the extra security concerns that followed) upon public attitudes (Brudvig, L. “Analysis of the Social Security Number - Validation Component of the Social Security Number, Privacy Attitudes, and Notification Experiment,” Census 2000 Testing, Experimentation, and Evaluation Program, September 27, 2002).

- ▶ Conduct qualitative research with members of targeted population segments that show lower mail responses rates, less acceptance of data-sharing, and less willingness to provide Social Security Numbers, to better understand their perspectives and reservations.
- ▶ Design research to identify other, currently unknown barriers to census responses (besides the attitudes and demographics identified in the present analysis) in order to ultimately reduce them (Singer, E., Hoewyk, J., Tourangeau, R., Steiger, D., Montgomery, M., & Montgomery, R. “Final Report of the 1999-2000 Surveys of Privacy Attitudes,” Census 2000 Testing and Experimentation Program, December 10, 2001).
- ▶ Conduct more research on the effect of Social Security Number requests upon response behavior that further examines: the characteristics of households that provide and do not provide numbers, the accuracy of households reconstructed from administrative records, and the effect of having and not having the number in household reconstruction (Brudvig, L. “Analysis of the Social Security Number - Validation Component of the Social Security Number, Privacy Attitudes, and Notification Experiment,” Census 2000 Testing, Experimentation, and Evaluation Program, September 27, 2002).
- ▶ Perform research that focuses upon the Social Security Number requests of all household members to identify factors other than attitudes (e.g., practical barriers), that may contribute to the nonresponse rates of Social Security Number requests, and develop new techniques that may overcome these non-attitudinal factors (Brudvig, L. “Analysis of the Social Security Number - Validation Component of the Social Security Number, Privacy Attitudes, and Notification Experiment,” Census 2000 Testing, Experimentation, and Evaluation Program, September 27, 2002).
- ▶ Design research to further examine the effect of general and specific notification upon response behavior by considering other interpretations of how they may be viewed (e.g., justifications), and by developing new methods that further establish the relationship between notification treatment conditions and behavior. Future research also needs to assess if providing information on the use of Social Security Numbers does not markedly decrease response rates and improves validation rates, as this may change future censuses.
- ▶ Develop research to assess the cumulative nonresponse to Social Security Number requests (i.e., unit nonresponse, item nonresponse, and invalid rates) to obtain an indicator of the extent to which matching to administrative records could take place (Brudvig, L. “Analysis of the Social Security Number - Validation Component of the Social Security Number, Privacy Attitudes, and Notification Experiment,” Census 2000 Testing, Experimentation, and Evaluation Program, September 27, 2002).
- ▶ Conduct a cost/benefit analysis that fully assesses all implications, should the Census Bureau consider asking census respondents for Social Security Numbers in future decennial censuses (Brudvig, 2002). Future research could also document the use of other identifiers that are used to link files with fewer costs (Brudvig, L. “Analysis of the Social Security

Number - Validation Component of the Social Security Number, Privacy Attitudes, and Notification Experiment,” Census 2000 Testing, Experimentation, and Evaluation Program, September 27, 2002).

1. Introduction

The Census Bureau undertakes a program of experimentation during decennial censuses to measure the effectiveness of new techniques, methodologies, and/or technologies in the special environment that a decennial census generates. Research findings form recommendations for subsequent testing and ultimately to the next decennial census design (Neugebauer, 1999).

Decennial censuses beginning in 2010 may rely on expanded use of administrative records information obtained from other Federal agencies. The use of administrative records could potentially increase completeness of measurement by reducing respondent burden with shorter questionnaires and improve data quality by eliminating memory/respondent errors. One method that would facilitate this process is to obtain Social Security Numbers from individuals that could be linked to administrative data (Guarino, Hill, & Woltman, 2001).

The expanded use of administrative records (accompanied by Social Security Number, or SSN, requests) has several implications for decennial methodology, as well as the Census Bureau's means of addressing privacy/confidentiality concerns, public education and notification, and even future relationships with other administrative agencies (U.S. Census Bureau, 2002). Before implementing such changes in census procedures, it is important to collect data to assess the public's attitudinal and behavioral responses to SSN requests and notifications of administrative record use in a decennial census (Neugebauer, 1999). Some questions immediately arise that concern how supportive the general public would be of data sharing across Federal agencies, how response rates of census questionnaires would be affected, and how accurate reported SSNs would be.

To address these issues, the Social Security Number, Privacy Attitudes, and Notification (SPAN) Experiment was designed to collect attitudinal and behavioral data related to the Census Bureau's use of administrative records. The purpose of SPAN was threefold (Neugebauer, 1999):

- ▶ To examine the public's attitudes on privacy and confidentiality as they relate to the notion of an "administrative records census;"
- ▶ To assess the public's response to Social Security number (SSN) requests on census forms;
- ▶ To determine how the public responds to differently worded notifications about the Census Bureau's use of administrative records (as presented in cover letters with Census 2000 forms).

1.1. Experiment Background.

The SPAN experiment had two major components. The survey component assessed the public's attitudes and concerns of privacy and confidentiality issues related to the use of administrative records. It is referred to as the Study of Privacy Attitudes in 2000 – or SPA2000. Random digit dial (RDD) telephone surveys were conducted both before and after Census Day 2000 to also assess the impact of all the associated publicity and promotion that creates a *census environment*.

The panel component consisted of two studies that examined issues surrounding the notification of administrative records use and respondents' provision of SSN information. Both studies used data from official Census 2000 materials. The first panel study, referred to as the SSN-Notification experiment, measured mail and item nonresponse rates when SSN is requested and notifications about administrative records are included (Neugebauer, 1999). The second panel study, the SSN-Validation experiment, examined the accuracy of respondents' reported SSNs by comparing them to the Census Numident file, provided by the Social Security Administration.

Past studies on privacy and confidentiality show that people who are most concerned with privacy participate less in surveys and censuses (Kulka, Holt, Carter, & Dowd, 1991; Singer, Mathiowetz, & Couper, 1993; Gates & Bolton, 1998). Given the connection between these concerns and SSN information, studies have been conducted to assess public opinion and response behavior to SSN requests on census forms. Although prior qualitative research indicated negative reaction to a SSN request, the 1992 Simplified Questionnaire Test (SQT) showed a smaller-than-anticipated decrease of 3.4 percent in mail response rates (Dillman, Treat, & Clark, 1994; Singer & Miller, 1992). Also, among respondents listed on the SSN census form, just over 1 in 10 failed to provide a SSN (Bates, 1992). These findings contradicted anticipated resistance to providing an identifier with "obvious" data linking implications (Guarino et al., 2001), suggesting the need for further research.

Prior research on notification of administrative record use is qualitative in nature and does not indicate the effect of notification on census response. Past findings reveal that focus group participants are generally unsure about what effect notification will have on census response (Guarino et al., 2001). Prior to the SPAN Experiment, no empirical research had measured the effects of SSN requests and public notifications on mail or item response rates in a decennial environment. In addition, no study had assessed how notification affects the validity of SSN responses. Therefore, the SPAN Experiment was designed to provide a better understanding of the potential ramifications of requesting SSNs on respondent behavior in a decennial census environment (Neugebauer, 1999).

1.2. Research Questions and Hypotheses

1.2.1. Survey Component

The main purpose of SPA2000 was to examine public attitudes toward the Census Bureau's use of administrative records (Neugebauer, 1999; Singer, Hoewyk, Tourangeau, Steiger, Montgomery, & Montgomery, 2001). SPA2000 had three research objectives:

- ▶ To determine the public's opinion of the Federal government and the Census Bureau;
- ▶ To assess the public's opinion of the Census Bureau's expanded use of administrative records and possible interest in collecting SSNs in the future; and
- ▶ To examine trends or changes in the public's attitudes using results from prior public surveys.

Three major comparisons were conducted to assess change in public attitudes.¹ First, the SPA2000 results were compared to results of earlier 1995 and 1996 public attitude surveys to assess trends and change over time. Next, “pre-census” attitudes collected in 1999 were compared to “post-census” attitudes obtained shortly after Census Day 2000 (with different samples). This comparison allowed assessment of the possible effect the *census environment* had on public attitudes. The third comparison was between census respondents and nonrespondents who completed the 1999 and 2000 surveys. To examine the relationship between attitudes and behavior, the surveys asked respondents whether or not their household planned to return or returned the census form. Respondents’ addresses were obtained during the telephone survey and matched against the Census Bureau’s Master Address File (MAF).

1.2.2. Panel Component

The panel component of SPAN consisted of two studies (the SSN-Notification and SSN-Validation studies) that investigated individuals’ behavioral responses to a SSN request and/or notification of administrative record use. Different SSN request strategies and notifications were used, and the SSN-Validation study further assessed the validity of reported SSNs.

- ▶ SSN-Notification

The purpose of the SSN-Notification study was to assess the effects of SSN requests and different notifications of administrative record use on census response behavior, specifically form return and form completeness (Guarino, Hill, & Woltman, 2001). The research questions addressed the effects of the SSN request and notification of administrative record use on mail response rates and item nonresponse rates:

- ▶ What is the effect of the SSN request on mail response rates and item nonresponse?
- ▶ What is the effect of notification of administrative record use on mail response rates and item nonresponse?

Based upon earlier research (Singer et al., 2001; Bates, 1992), two hypotheses were proposed on the effects of SSN requests upon mail and item nonresponse rates. Four additional hypotheses were included regarding the effects of notification on responses. Because this study was the first to examine notification effects, there was little guidance from prior research to aid in their development (Guarino et al., 2001). Any indication of reduced mail response rates or increased number of incomplete forms due to respondents’ exposure to the treatment conditions further increased the need for follow-up or imputation by the Census Bureau.

¹ Following Census 2000, the Census Bureau commissioned a small, post hoc phone survey of Puerto Rico residents in an effort to understand their lower than expected response to Census 2000. Results showed that the sample’s attitudes toward the census, confidentiality, and privacy did not seem to explain their lower Census 2000 response rate (Singer et al., 2001). Yet, these attitudes may not mirror those held by survey nonrespondents (43 percent) nor by the 37 percent of residents who do not own telephones. See Singer et al., (2001) for details.

Hypotheses (Guarino et al., 2001) and Associated Outcomes:

1. Mail response rates will drop when a SSN request is present, with a larger observable effect in areas of typically low census coverage, where response is already low, compared to high coverage areas.
 - ▶ *Mail responses did drop, yet there was no difference in the extent of the drop between the census coverage areas, see p. 14.*
 2. The request for SSN will increase the amount of incomplete forms returned compared to no SSN request.
 - ▶ *The increase in incomplete forms returned occurred with the SSN request for all household members, yet showed no effect with SSN request for Person 1, see p. 15.*
 3. Notification of administrative record use will cause significant drops in mail response and increases in the amount of incomplete forms returned, with specific notification (with agency names) having a stronger effect than general notification.
 - ▶ *Decreases in mail response were revealed, yet there was no effect on form completeness and no differences according to type of notification, see pp. 14-15.*
 4. Requesting SSN in addition to providing either type of notification will decrease response compared to providing notification alone.
 - ▶ *No additional drop in mail response was incurred with the inclusion of the SSN request, see pp. 14-15.*
 5. The SSN item for Person 1 will be missing at a higher rate when general or specific notification is included with the SSN request.
 - ▶ *Instead, lower SSN item response rates were revealed when the SSN request was made without notification, see p. 15.*
 6. Notification of administrative record use will increase the amount of incomplete forms returned in a more pronounced way when joined with the long form than the short form.
 - ▶ *No differences were shown by form type, see p. 15.*
- ▶ SSN-Validation

The SSN-Validation experiment examined four research questions concerning the accuracy of provided SSNs in general and by coverage area, SSN request strategies, and notification (Brudvig, 2002). The results of the SSN-Validation experiment were further compared to the results of the mid-cycle 1992 SQT SSN validity rates.

- ▶ Are the SSNs provided accurate?
- ▶ Are there differences in SSN verification rates between High and Low Coverage Areas?
- ▶ Are there differences in the valid SSN rates between the two SSN request strategies and the two types of notifications of administrative records use?
- ▶ How do the Census 2000 SSN validation rates compare to the 1992 SQT rates?

Based upon results of prior research (Bates, 1992; Dillman, Sinclair, & Clark, 1993; Leslie & Treat, 1994; Singer, & Miller, 1992), three hypotheses were presented on the validation rates of reported SSNs overall, by coverage area, and by person number. Two more hypotheses were included on the effects of notification upon SSN response validity. As the first study to assess how notification affects SSN response validity, there was little guidance from prior research to aid in their development. Ultimately, any inaccuracy among reported SSNs required more follow-up and imputation by the Census Bureau.

Hypotheses (Brudvig, 2002) and Associated Outcomes:

1. The SSN validation rate will be high when SSN is reported (see Leslie & Treat, 1994).
 - ▶ *The SSN validation rates of reported SSNs was high, see p. 16.*
2. There will be little difference in validation rate in areas of typically low census coverage (LCA) compared to high coverage (HCA) areas (see Bates, 1992).
 - ▶ *The HCA rate was slightly higher than the LCA rate, see p. 16.*
3. SSN validation rates will steadily decrease by Person number. Person 2 will have higher SSN validation rates than Person 3 and so on through Person 6 (Bates, 1992).
 - ▶ *SSN validation rates did decrease by Person number, see p. 16.*
4. Notification of administrative record use will cause small but significant drops in SSN validation rates, with specific notification (including agency names) having a stronger effect than general notification.
 - ▶ *Notification had no effect upon SSN validation rates, see p. 16.*
5. Requesting SSN in the absence of general or specific notification will yield higher validation rates for Person 1 when SSN is requested only for Person 1 as compared to all household members.
 - ▶ *No differences were revealed, see p. 16.*

2. Methodology

2.1. Survey Component (SPA2000)

2.1.1. Research Design and Sample

SPA2000 was conducted by The Gallup Organization and the Institute of Social Research's (ISR) Survey Research Center at the University of Michigan. It consisted of two list-assisted random digit dial surveys of the telephone population of adults age 18 or older within the United States. The pre-census survey was conducted between July and October 1999, before advertising, promotion, and enumeration began for Census 2000, while the post-census survey occurred immediately after Census Day between April and July 2000. The pre-census survey sample included 1,681 interviewed respondents and the post-census survey sample included 1,978 respondents (see Singer et al., 2001, for details of the sampling procedure). The final response rates for the 1999 and 2000 telephone surveys were 61.9 percent and 61.1 percent, respectively (Singer et al., 2001).

To determine trends in the public's privacy attitudes, the results of the 1999 survey and the 2000 survey were compared to two earlier random digit dial telephone surveys commissioned by the Census Bureau. Their samples also consisted of the telephone population of adults 18 or older within the United States and both of the earlier surveys included items addressing the same attitudinal issues. The first survey – the 1995 Joint Program in Survey Methodology Practicum Survey on Privacy and Confidentiality, or the “1995 JPSM” – was conducted between February and July 1995 by students at the University of Maryland and by the University of Maryland Survey Research Center, with 1,443 respondents and a response rate of 65 percent (Singer and Presser, 1996). The second telephone survey – the 1996 Study of Public Attitudes Towards Administrative Records Use, or the “1996 SPARU” – was performed by Westat between June and September of 1996, with 1,215 respondents and a response rate of 64.4 percent (Kerwin & Edwards, 1996; Singer, Presser, & Van Hoewyk, 1997).

The comparison between census respondents and nonrespondents required usage of the Census Bureau's Decennial Master Address File (DMAF). During the telephone interviews, respondents were asked to provide and/or verify their addresses. Among respondents, addresses were obtained from 83.4 percent in 1999 and 85 percent in 2000. Responses were compared to the DMAF, with 2182 of the 3655 respondents (or 59.7 percent) providing successfully matched addresses (see Singer et al., 2001). This group became the sample used in the comparison of census respondents and nonrespondents. The overwhelming majority had city-style addresses (versus rural addresses).

2.1.2. Survey Instrument

The 1999 and 2000 survey instrument was very similar to the 1996 SPARU survey, which largely replicated the 1995 JPSM survey (Singer et al., 2001). However, there were some minor changes. For instance, many respondents of the earlier surveys either reported incorrect knowledge or a lack

of knowledge about whether the Census Bureau shared data with other agencies. Variations of these questions were therefore introduced to further explore this issue. To assess privacy attitude changes over time, some of the privacy-related items from the 1995 JPSM study that were excluded from the 1996 SPARU (to save time and reduce costs) were again included in the 1999 and 2000 surveys (see Article A). Some of these re-introduced items originate from the 1990 Survey of Census Participants (Neugebauer, 1999). Next, some experiments with question wording and order which showed no impact upon 1996 survey responses were omitted from the 1999 and 2000 surveys (Singer et al., 2001). Finally, the survey was translated to Spanish, with Spanish-speaking interviewers available for those who preferred to be interviewed in Spanish.

The question content of the SPA2000 surveys can be grouped under six major topics (for further details, see Article B or Singer et al., 2001):

- ▶ *Knowledge about and Attitudes toward the Decennial Census*: includes items that address the perceived importance and awareness of the census and its uses, the obligation to cooperate with the census, and opinions toward the census as an invasion of privacy.
- ▶ *Beliefs and Attitudes about Confidentiality*: includes items concerning beliefs about data sharing and the protection of confidentiality by the Census Bureau, in addition to whether the Census Bureau can be trusted to keep information confidential.
- ▶ *Attitudes toward the Use of Administrative Records*: includes questions that address opinions toward data sharing with other Federal agencies to reduce the undercount, replace the short form, and as a means of collecting long-form information.
- ▶ *Attitudes toward Privacy Concerns*: includes items about privacy concerns, the protection of personal privacy, and the perceived control over usage of one's personal information.
- ▶ *Attitudes of Alienation from the Government*: includes items regarding beliefs of personal influence, personal representation, confidence in the government, and trust issues.
- ▶ *Willingness to Provide Social Security Numbers*: includes a general measure of this issue, and further considers how it relates to data sharing, privacy, and demographic characteristics.

The pre- and post-census surveys also included items concerning whether or not respondents planned to return or returned the census form (wording varied by survey date). Further questions about media exposure were included in the 2000 post-census survey after it was in the field. These items inquired about the respondent's exposure to news media about the census (positive or negative), and contributed to the assessment of the census environment's impact upon public attitudes. Lastly, demographic information was collected (e.g., age, gender, race, income).

2.2. Panel Component

2.2.1. Research Design and Sample

The SSN-Notification and SSN-Validation panel studies used data collected during Census 2000. Ten panels were designed with differing experimental treatments and selected households were randomly assigned to each panel. The sampled households received all of the census mailout materials in the standard sequence and timing. The experimental letters and forms were the official census forms received by the households (Guarino et al., 2001; Neugebauer, 1999). The experimental questionnaires were later checked-in and data captured by the Decennial Systems and Contracts Management Office (DSCMO) and the National Processing Center (NPC).²

Among the ten total panels, seven panels received short census forms and three received long forms.³ Two panels served as controls, one receiving the short form and the other receiving the long form. These panels were presented with the standard, official Census 2000 materials, with no SSN request and no notification of administrative record use in their cover letters (i.e., the experimental conditions). The remaining eight panels consisted of the following:

- ▶ *SSN Request Only*: Two short form panels received forms with a SSN request for either all household members or for only Person 1. Their cover letters were similar to the official Census 2000 materials, yet included an extra statement informing respondents that providing SSN was voluntary.
- ▶ *Notification Only*: Two short form and two long form panels received cover letters that included either “general” or “specific” notifications describing how and why the Census Bureau may use administrative records data from other Federal agencies. The general notification mentioned the Census Bureau’s possible use of statistical data from other Federal agencies, whereas the specific notification further named specific Federal agencies (e.g., Internal Revenue Service, Social Security Administration).
- ▶ *SSN Request AND Notification*: Two short form panels received a combination of *both* the voluntary SSN request for all household members and one of the two notifications (general or specific). Table 1 of the Appendix presents the wording used for the SSN request and the notifications.

² Specifically, the DSCMO wrote the specification for keying the forms from paper and the special unit at the NPC captured the census data by keying from the paper questionnaire (Neugebauer, 1999). The data from Census 2000 non-experimental forms were captured through imaging.

³ The short census form had eight items for Person 1 and six items for each remaining household member (including SSN requests). Five items requested the same information for all household members (sex, age, date of birth, race, Hispanic origin). Person 1 was further asked the number of household members, type of residence, and phone number, while other household members were asked to indicate their relation to Person 1. The long census form consisted of 53 items for Person 1 and 33 items for each remaining household member. All items on the short form were a part of the long form, plus added items about topics such as employment, military service, and income.

Specifically, the ten panels of the SSN-Notification study are provided below. The SSN-Validation study only examined the four panels with SSN requests (i.e., panels 1, 2, 3, and 4).

(1) Short form: SSN Request, All Household members	←	<i>SSN-Validation</i>
(2) Short form: SSN Request, One (Person 1)	←	<i>SSN-Validation</i>
(3) Short form: All SSN Request + General Notification	←	<i>SSN-Validation</i>
(4) Short form: All SSN Request + Specific Notification	←	<i>SSN-Validation</i>
(5) Short form: General Notification		
(6) Short form: Specific Notification		
(7) Long form: Specific Notification		
(8) Long form: General Notification		
(9) Control form (short form census)		
(10) Control form (long form census)		

The sample of households was taken from the July 1999 version of the Decennial Master Address File (DMAF) mailout/mailback universe. It was equally allocated to two strata, known as low and high coverage areas (LCA and HCA, respectively), that reflected expected differences in population composition by race, tenure, and anticipated Census 2000 return rates based on 1990 Census data (Guarino et al., 2001). The LCA stratum was believed to contain a very high proportion of African-American and Hispanic populations and renter occupied housing units.

Approximately 52,000 U.S. households were selected and randomly assigned to each experimental panel. The mailout sample size for each of the ten panels consisted of a little over 5,200 addresses, equally allocated to the HCA and LCA strata (i.e., around 2,600 addresses per strata). Specific details about address omissions (e.g., undeliverables, duplicates) and replacements can be found in Guarino et al., 2001.

The SSN-Notification study included all 52,000 households randomly assigned to one of the ten panels. The SSN-Validation study's sample included the number of reported SSNs for persons in the 20,998 households within panels 1 through 4 that returned census forms. There were 21,745 reported SSNs, with panels 1, 3, and 4, providing around 6,300 SSNs each. Panel 2 respondents reported 2,713 SSNs, which is lower as only one SSN was requested per household.

2.2.2. *Measurements*

► SSN-Notification Study

Mail response was defined as the number of non-blank forms returned by mail for the panel divided by the number of forms mailed out less those returned by the U.S. Postal Service as "undeliverable as addressed." Using a modified census algorithm, blank forms were returned forms, in which the number of completed items for the household, person 1 and person 2 was less than two and marked as "non-respondents" (Guarino et al., 2001).

Form completeness was measured two ways. First, item nonresponse rates were the percent of missing data for a given item over all forms returned by households (with similar calculations performed for person-level characteristics). A second indicator signified which households had at least some missing data on their forms for the household or its members (e.g., count, sex, age, race).

Using the Bonferroni multiple comparison procedure (MCP), pairwise comparisons were conducted to assess differences in SSN item nonresponse rates among the panels. Response rates and form completeness rates were modeled using logistic regression. Unlike pairwise comparisons, the logistic regression approach permits evaluation of whether differences in rates for each of the experimental treatments were influenced by the presence of other treatments. Further, it maximizes power and allows estimation of possible interaction effects for the SSN request factor (none, all) and the notification factor (none, general, and specific) by both the short and long form types (Neugebauer, 1999). See Guarino et al., (2001) for details.

- ▶ SSN-Validation Study

Reported SSNs were compared to the Census Numident file, provided by the Social Security Administration. Valid SSN responses were those with matching SSNs and either “direct” or “indirect” name matches, as classified by category (see Brudvig, 2002, for details). Invalid SSNs were those reported that had less than nine digits, were not in the Numident, or were in the Numident, but with a non-matching name.

3. Major Findings

3.1. Survey Component

SPA 2000 consisted of three major comparisons. Each is presented below.⁴

3.1.1. Trends in Privacy Attitudes (Comparing Responses from 1995-2000)

Before discussing trends across the five-year period, it should be noted that there were very few changes in reported attitudes between the one-year span of 1995 and 1996 (Singer et al., 2001). Many questions showed greater changes from 1996 to 1999, when the time lapse was longer. Unlike the time lapse between 1995 and 1996, heightened census publicity occurred between 1999 and 2000, which was expected to potentially impact responses in 2000.

⁴ In Sections 3.1.1. (Trends in Privacy Attitudes) and 3.1.2. (The Effect of the “Census Environment”), any statements noting significant changes are based on a significance level of 0.05 (see Singer et al., 2001).

- ▶ *Knowledge and Awareness of Census and Its Uses:* One pattern of change was revealed among items related to knowledge and awareness of the census, as well as beliefs of its importance and the obligation to cooperate. Each of these items showed small variations between 1995 and 1999, and then large changes between 1999 and 2000 – all in the direction of greater knowledge and awareness (see Table 2). For instance, the percentage who reported awareness of census uses in 1995 and 1996 were 46.7 percent and 51 percent, respectively; followed by a very large increase from 51.7 percent to 70.6 percent between 1999 and 2000. The publicity surrounding the *census environment* likely contributed to this pattern of change in awareness (Singer et al., 2001).
- ▶ *Beliefs about Confidentiality:* Another pattern of change occurred among items about respondents' knowledge of the Census Bureau's confidentiality practices and related laws. All of these questions showed small but statistically significant trends in the direction of greater accuracy (i.e., reporting that the Census Bureau cannot and does not share its files with other agencies). Most of the revealed changes were evenly spread over the five years, although two items specifically showed statistically significant changes between 1999 and 2000. The percentage of respondents who correctly knew that other government agencies could not get identifiable census information increased from 12.2 percent in 1999 to 17.3 percent in 2000. There was also a decrease between the two years (from 29.7 to 19.0 percent) of those who believed that the Census Bureau is not forbidden by law to keep information confidential (Singer et al., 2001).
- ▶ *Concerns about Data Sharing and SSN Requests:* Even though trends of increasing knowledge about the census and related confidentiality practices were shown, there was a pattern of increased concern and disapproval of data sharing (see Table 2). In both 1999 and 2000, around 45 percent of respondents reported that it would bother them "a lot" if their census data were shared with anyone outside the Census Bureau -- a significant increase from the 38.7 percent in 1996. Declines in approval of data sharing were also evidenced whether it was to reduce the undercount, replace the census, or replace the long form. Expressed willingness to provide one's SSN declined between 1996 and 1999 from 68.3 to 55.1 percent, with no change (55.9 percent) in 2000 (Singer et al, 2001).
- ▶ *Trust and Privacy Concerns:* In light of the above trends, one might expect increases in distrust towards the Census Bureau or the government, or in privacy concerns. Yet, beliefs about the Census Bureau's possible misuse of census data showed declines or no change (see Table 2). In fact, the percentage that trusted the Census Bureau to keep data confidential stayed around 67-69 percent for 1996, 1999, and 2000. Trust in the government also showed a small, statistically significant increase between 1996 and 2000. Results related to privacy concerns showed small, yet statistically significant, increases between 1995 and 2000 in the percentage who were "very worried" about their personal privacy (22 vs. 25 percent), and who "strongly agreed" that people have lost control over personal information (40 vs. 44 percent). Yet, those who viewed the census as a privacy invasion showed a small, yet statistically significant, *decline* between 1995 and 2000 (24 vs. 21 percent).

3.1.2. *The Effect of the “Census Environment” (Comparing 1999 and 2000 Attitudes)*

- ▶ *Changes in Beliefs:* Results showed several statistically significant, cross-sectional changes between the 1999 and 2000 responses of survey participants (see Table 2). People’s awareness of uses of the census increased, as did the importance they attached to it. There was an increase in the percentage who perceived (correctly) that other agencies could not obtain census information and who knew the Census Bureau is required by law to protect data confidentiality. More respondents in 2000 than in 1999 also agreed that people should cooperate with the census (66 vs. 50 percent). These changes can likely be attributed to the *census environment* and its related publicity (Singer et al., 2001).
- ▶ *Unchanging Beliefs:* At the same time, some items showed no statistically significant change between 1999 and 2000 (see Table 2). Although the percentage of respondents who correctly believed that the Census Bureau is required by law to protect data confidentiality increased, there was no significant increase in the percentage who *believed* the Census Bureau protects data confidentiality (around 23-25 percent) and who *trusted* the Census Bureau to keep data confidential (around 68-69 percent). Nor was there any change in the generalized trust that people expressed in the Federal government. Judging by all the findings, these items may have tapped into elements of trust versus awareness or knowledge about the census and the law (Singer et al., 2001). Those who viewed the census as an invasion of privacy further remained unchanged (around 22 percent).
- ▶ *Privacy Concerns, Data Sharing, and Willingness to Provide SSNs:* First, respondents’ general concerns about privacy revealed a small, yet statistically significant decline from 1999 to 2000. Yet, the percentage reporting that it would bother them if their census information was not kept confidential, or was given to another agency, remained unchanged. In terms of respondents’ willingness to have the Census Bureau use data from other agencies for specific purposes, the percentages favoring data sharing to fix the undercount (around 44 percent) or to eliminate the long form census (around 43-44 percent) did not change. The proportion that favored data sharing to eliminate the census, however, showed a statistically significant decline from 1999 to 2000 (47 vs. 42 percent, respectively). Finally, the willingness to provide one’s SSN did not change between 1999 and 2000, remaining around 55-56 percent (Singer et al., 2001).
- ▶ *Attitude Predictors:* A series of demographics (e.g., age, gender, education, race, income) were examined to see if they impacted attitudinal responses. In very general terms, data sharing among agencies under certain circumstances was more accepted by people who were better-educated, self-identified as Hispanic, female, and younger; whereas nonwhites were less willing to have agencies share data to reduce the

undercount.⁵ The willingness to provide one's SSN was indicated more by people who were better-educated, self-identified as Hispanic, and older; while nonwhites, females, and those who did not report an income were less willing to provide their SSNs. Results by gender, age, and income were more inconsistent across the survey items (e.g., census knowledge, privacy and trust issues) than those pertaining to education and race/ethnicity. Please refer to Singer et al., (2001) for further details.

- *The Impact of Media Exposure on Attitudes in 2000:* A portion of the 2000 survey respondents were asked about their exposure to news and publicity about the census. Among this group, 30 percent self-reported no exposure, 28 percent had been exposed to only positive publicity (e.g., its importance), 20 percent were exposed to only negative media (e.g., confidentiality issues), and 22 percent had encountered both positive and negative publicity. Analyses were performed to examine the effects of different publicity exposures upon survey responses in comparison to no exposure (see Table 3a). Further analyses compared the effects of positive-only and negative-only exposures upon attitudinal responses to the effects of receiving both exposure types (see Table 3b).⁶

In sum, the group reporting both *positive and negative exposure* was more knowledgeable about the census and considered it to be more important than the “*no exposure*” group. They were also more likely to believe the Census Bureau protects confidentiality and that there is an obligation to cooperate. Yet, they also had more privacy concerns than those reporting no exposure. The “*only negative exposure*” group showed similar responses to those reporting exposure to both publicity types, except they were less likely to believe the Census Bureau's confidentiality assurances and to endorse an obligation to cooperate. The “*only positive exposure*” group showed several attitudinal differences compared to those who reported exposure to both publicity forms. For instance, those who had encountered only positive media viewed the census as more important, were more trusting of confidentiality assurances, and more willing to provide their SSNs.

3.1.3. *Privacy Attitudes Vs. Response Behavior (Comparing Respondents to Nonrespondents)*

- *Mail Return Rates:* The mail return rates of the 2182 respondents who provided successfully matched addresses were examined using the SPA2000 item asking whether respondents planned to return (pre-census) or returned (post-census) the 2000 Census form. Nearly 100 percent of the 1999 and 2000 survey respondents affirmatively responded to this item. Around 86 percent of both 1999 and 2000 respondents *actually*

⁵ Usage of the term “nonwhite” corresponds with the original study's terminology (see Singer et al., 2001).

⁶ All regressions analyses that examined the effect of media exposure upon attitudinal responses included the following demographic control variables: gender, education, age, ethnicity, race, income, and a variable indicating whether or not income had to be imputed for the respondent (Singer et al., 2001).

returned their census forms. Short census form recipients had higher return rates than long form recipients (in 1999, 87 vs. 78 percent; in 2000, 88 vs. 81 percent, respectively).

- ▶ *Predictors of Mail Returns:* Possible predictors of mail returns were assessed using a logistic regression equation with form type, demographic variables, and attitudinal variables as predictors for the 1999 and 2000 samples. Results indicated that form type was highly significant in both years, with those receiving the long form being only half as likely to return the form as short form recipients. Age and education were positive predictors of mail returns for both years. In 1999, women were more likely to return their census form, while nonwhites in 2000 were less likely to return their forms. With the 1999 sample, the willingness to provide one's SSN and the contrary belief that census data may be misused were both predictors of higher mail return; whereas failure to provide income was a significant negative predictor. In 2000, three attitudes were related to lower census return: concerns about privacy, concerns about census misuse, and support of data sharing in order to eliminate the census (see Table 4a). All analyses of attitudinal predictors included demographic control variables.
- ▶ *Matched Versus Unmatched Respondents:* Analyses of the two groups' demographics and attitudes revealed that older respondents in 1999 were more likely to provide matched addresses; while Hispanics and those with lower incomes were less likely to give matched addresses in 2000. In general, those who provided matchable addresses had fewer privacy concerns and were more favorable towards data sharing and providing their SSNs than those with unmatchable addresses [see Table 4b or Singer et al., (2001)].

3.2. Panel Component

The panel component of SPAN consisted of two studies (the SSN-Notification and SSN-Validation experiments) that investigated individuals' behavioral responses to a SSN request, using different strategies and notification of administrative record uses, and further assessing the validity of respondents' provided SSNs.

3.2.1. SSN-Notification Experiment

The SSN-Notification experiment addressed four research questions concerning the effects of the SSN request and notification of administrative record use on mail response rates and item nonresponse rates. To test the hypotheses, logistic regression analysis modeled a household's odds of responding to the census (Guarino et al, 2001).

- ▶ *The Effect of the SSN Request on Mail Response Rates:* Mail response rates were expected to decrease when a SSN request was presented, with a more pronounced effect in low census coverage areas (LCA) than high coverage areas (HCA). Logistic regression results indicated that the SSN request for Person 1 and for all household members significantly decreased mail response rates (see Table 5). Specifically, the odds of responding to the census decreased by 9.5 percent when requesting the SSN of only

Person 1, and decreased by 11 percent when all household members' SSNs were requested. The drop in odds suggests about a 2.1 percent decrease in responses among HCA areas and a 2.7 percent decrease in LCA areas when the SSN for all household members is requested (Guarino et al., 2001).⁷ This response decrease was statistically significant and supported the hypothesis, yet it was smaller than expected. Contrary to the hypothesis, however, no differential effects of the SSN request on response was revealed between the two coverage areas (SSN * Strata = -.006, see Table 5).

- *The Effect of Notification of Administrative Record Use on Response Rates:* Notification of administrative record use was expected to lead to significant decreases in mail responses, with specific notification (including agency names) having a stronger effect than general notification. As anticipated, results indicated that taken together, general and specific notification of administrative record use decreases mail response.⁸ Examination of the separate effects of each notification type indicated that general notification caused a small, yet significant, response decrease, while specific notification did not (see Table 5). Nonetheless, further analysis of the magnitude of the effect on response between general and specific notification was not statistically different. These results appeared to contradict the anticipated stronger effect of specific notification.

The inclusion of notification with the SSN request was further expected to decrease response compared to presenting the notification alone. However, the logistic regression analysis, combining general and specific notification treatments, did not reveal sufficient evidence to conclude that notification of administrative record use further discourages response in the presence of a SSN request compared to notification alone ($p = .1056$).

- *The Effect of the SSN request on Item Nonresponse Rates:* Given the prior level of resistance towards providing SSNs (Singer et al., 2001), the request for SSN was expected to increase item nonresponse rates. To test the hypothesis, the effect of treatments on item nonresponse was assessed by looking at the effect of each treatment on the likelihood of a household having any missing data among 100 percent person items in addition to household tenure. One striking feature of these data was the relatively low rates of missing data across all treatments (see Guarino et al., 2001).

In accordance with the prediction, logistic regression results showed that the SSN request for all household members was associated with having missing data on the returned census form (see Table 6). Analysis of the effect of the SSN request for solely Person 1 revealed no association between the request for Person 1's SSN and missing data. Yet,

⁷ Interpretation of the logistic regression results was based on parameter estimates and odds ratios of significant experimental treatment effects (Guarino et al., 2001). For details, see Guarino et al., (2001).

⁸ The simultaneous significance of the general and specific notification was tested by summing the parameters and comparing the result to zero in a F-test ($H_0: \beta_{\text{specific}} + \beta_{\text{general}} = 0$). The results showed that $F = 4.59$ at $p = .033$ (Guarino et al., 2001).

collectively, any request for SSN would seem to increase the odds of having at least some missing data on the form (Guarino et al., 2001). A greater amount of missing data was further evidenced among returned long census forms than short forms, while less missing data were shown among returned forms from the high coverage areas compared to the low coverage areas (see Table 6).

- *The Effect of Notification on Item Nonresponse:* The notification of administrative record use was expected to cause increases in item nonresponse, with specific notification having a stronger effect than general notification. Results revealed that notification did not appear to adversely affect form completeness. Individually, neither type had an effect, nor did one type have a stronger effect than the other. It was also predicted that notification would have a more harmful effect on form completeness on the long form than the short form. Regression analyses showed no differential effects of notification on form completeness between the long and short forms, regardless of notification type.

Finally, the SSN item for Person 1 was expected to be missing at a higher rate when notification was included with the SSN request. Using data from the four panels that had SSN requests, the SSN item nonresponse rates for Person 1 were computed (see Table 7a). Pairwise comparisons revealed that lower SSN item response rates were obtained for Person 1 when the SSN was requested without specific or general notification of administrative use (see Table 7b). The distinction between general and specific notification had no measurable influence on response to the SSN item for Person 1. These findings contradict the hypothesis, yet may suggest that respondents viewed notification as justification for the SSN requests (Guarino et al., 2001)

3.2.2. SSN-Validation Experiment

The SSN-Validation experiment examined the accuracy of provided SSNs in general, by coverage area, SSN request strategies, and notification. In addition, the results were compared to the earlier 1992 SQT SSN validation rates (collected during a mid-cycle, between censuses).

- *The High Degree of Accuracy of Provided SSNs:* SSN Validation rates were expected to be high when SSNs were reported. Accurate SSN response outcomes were defined as direct or indirect instances in which the respondents' reported SSN and name matched an

SSN, name, and as needed, date of birth and gender on the Census Numident file. Results revealed that the majority of SSN response outcomes were direct matches, with an overall match rate of 94.3 percent. Indirect matches showed an overall match rate of 0.4 percent. With a low overall rate of 5.2 percent among invalid SSNs, results confirmed the expected high SSN validation rate among reported SSNs.

- *The SSN Validation Rates of HCAs and LCAs:* It was predicted that there would be little difference between the validation rates in areas of typically high and low coverage areas. Both areas demonstrated high rates over 90 percent, with the LCA rate of 92.8 percent

being slightly lower than the HCA rate of 95.2 percent. The 2.4 percent difference between the two areas is small, yet was shown to be statistically significant.

- ▶ *The Effect of SSN Request Strategy (One vs. All) on Validation Rates:* The high validity rate of Person 1's reported SSN basically stayed the same whether asked to report one's own SSN or the SSN of all household members. For all four panels, the valid SSN rates for Person 1 ranged from 96.0 percent to 96.9 percent, with pairwise comparisons showing a difference of less than one percent between each of the panels. SSN validation rates were predicted to steadily decrease by Person number (i.e., Person 2 would have higher validation rates than Person 3 and so on through Person 6). As expected, results indicated patterns of decreasing validation rates for Person 2, Person 3, and so on through Person 6 for each of the three panels that requested all SSNs (see Table 8). One exception to this pattern was a slight increase for Person 5 in Panel 4 (all SSNs, specific notification), which further appeared to show a general pattern of slightly higher rates across household members (specifically, Person 2, Person 4, and Person 5) compared to the two other panels. Nevertheless, each of the three panels still revealed good validation rates for all persons, with all Person 2 valid SSN rates just over 95 percent and the lowest valid SSN rate for Person 6 among the panels being 80.2 percent (Panel 3, all SSNs, general notification).
- ▶ *The Effect of Notification on SSN Validation Rates:* Validation rates were predicted to drop when notification was included with the SSN request. Specific notification was further expected to result in lower SSN validation rates than the general notification condition. Pairwise comparisons of the four panels were restricted to only the valid SSN rates of Person 1, as Panel 2 only requested one SSN, and the others requested all SSNs. Panels 1 and 2 received SSN requests with no notification, whereas Panels 3 and 4 received SSN requests with general and specific notification, respectively. As stated above, the valid SSN rate for Person 1 in all four panels was very high, with little difference between them. Subsequently, the two hypotheses regarding the impact of notification upon valid SSN rates were not confirmed (Brudvig, 2002).
- ▶ *Similar SSN Validation Rates for Census 2000 SPAN and Earlier 1992 SQT Study:* The SSN-Validation experiment was the first of its kind to examine how the inclusion of administrative record use notification would affect the validity of reported SSNs. Yet, it is not the first study to request SSNs from respondents. Bates' 1992 SQT panel study also obtained reported SSNs for all household members and compared them to the Census Bureau's Numident file. A comparison of the two studies' findings showed that the valid and invalid SSN rates for the two studies were similar: 1992 SQT Panel, valid rate, 91.0 percent, invalid rate, 8.0 percent, and SSN-Validation Panel 1, valid rate, 94.8 percent, invalid rate, 5.2 percent. Taken together, these results indicate that respondents who choose to report a SSN are most likely to report an accurate one. The three percent increase in SSN validation rates is probably caused by improvements in SSN validation procedures at the U.S. Census Bureau (see STAR0004-00, 2001).

4. Implications and Recommendations

SPAN was designed to collect attitudinal and behavioral data related to the Census Bureau's expanded use of administrative records. Specifically, SPAN examined the public's attitudes regarding privacy and confidentiality, responses to SSN requests on census forms, and responses to different forms of notification about the use of administrative records. The goal of SPAN was to provide information that would assist with decisions regarding future decennial methodology. In this section, the results of SPAN's survey and panel components are collectively summarized with commentary, leading up to the final list of recommendations on page 23.

4.1. Public Attitudes Toward the Census

The SPA2000 results indicated that the public has steadily increased its knowledge and awareness of the census, its uses, and laws related to confidentiality practices. Census 2000 publicity also seemed to enhance the public's knowledge and endorsement to cooperate with the census – especially when later reports indicate that the nation's 67 percent response rate was higher than expected (Decennial Media Relations Office, 2000).

4.1.1. Trust in the Census Bureau and Privacy Concerns

Although long-term trends reveal slight increases in the public's belief that the Census Bureau *actually* protects data confidentiality, there were no reported differences between the beliefs of the 1999 and 2000 samples. In addition, the public's trust in the Census Bureau to keep data confidential has remained virtually unchanged since 1996. One area in which Census 2000 publicity had very little impact was upon the public's assurance and trust that the Census Bureau does not misuse census data (Singer et al., 2001). Future census publicity efforts may want to apply greater focus to trust and confidentiality issues, especially in light of their connection to respondent behavior (see below).

Review of the long-term privacy attitude trends show small increases in public concerns about personal privacy and the loss of control over personal information. These concerns are beyond the single scope of the census and seem to refer to today's climate of increasing reliance upon technology in communication and business transactions. Increased concerns about privacy (and fraud) in other arenas, however, can subsequently carry-over and affect census-related attitudes. The SPA2000 survey showed that over the past five years, there has been a small decline in public views of the census as an invasion of privacy, with no difference between views in 1999 and 2000. Perhaps the public has grown more accustomed to providing personal information in today's information age, or it distinguishes the Census Bureau as a more credible collector of such information. In addition to more confidentiality assurances, future census publicity efforts may want to emphasize its distinction and credibility in comparison to the private sector.

4.1.2. Public Views on Data Sharing and Providing SSNs

Growing numbers of citizens may agree that everyone has an obligation to cooperate with the census, yet when the idea of sharing data among Federal agencies or of providing one's SSN number is presented, trends reveal that increasing numbers express disapproval. Long-term declines in approval of data sharing were revealed whether the purpose was to fix the undercount, eliminate the long form, or to eliminate the short form and use a "records only" census (which showed a further 4.2 percent decline in approval between 1999 and 2000). Furthermore, nearly half (or 45 percent) reported that it would bother them "a lot" if their census information was shared with anyone outside the Census – a significant increase from prior years. Expressed willingness to provide one's SSN significantly declined from 68 percent in 1996 to 55 percent in 1999, with no further change in 2000. Interestingly, people who even *avored* data sharing displayed decreasing willingness to provide their own SSNs between 1996 and 1999.

Based on these findings, the public seems accepting of the census and its uses, yet discussions of data sharing and in particular, the usage of SSNs as identifiers, may heighten privacy concerns or fears concerning misuse and fraud in today's realm of information collection. More specific to governmental policy, some groups may even perceive the idea of data sharing and the usage of SSNs as identifiers as a privacy violation that goes beyond the information absolutely needed by the Census Bureau (e.g., H.R. 4085, 2000). Judging by the reported attitudes, less than half of the 1999 and 2000 survey respondents favored the idea of data sharing and a little over half of the samples expressed willingness to provide their SSNs. It was further revealed that nonwhites and women showed less willingness to provide their SSNs than Caucasians and men, with nonwhites also reporting less approval of data sharing to reduce the undercount. Future exploration of these population segments' specific concerns may be helpful.

4.1.3. The Impact of Recent National Events

One potentially important consideration is how the events of September 11, 2001 (and the extra security concerns that have followed) may have affected recent public attitudes related to privacy concerns, data sharing, and the provision of one's SSN (Brudvig, 2002). For instance, the SPA2000 survey results have already demonstrated greater privacy concerns among nonwhites. Since September 11th, this difference may have increased, with some groups within the nonwhite segment possibly fearing that expanded data sharing could result in national procedures similar to those taken during World War II with Japanese-Americans in the United States. Any potential public concerns (and fears) resulting from September 11th, would likely correspond with attitudes about privacy and the government in general. Therefore, the impact of September 11th cannot be overlooked. Yet, it is difficult to know if current attitudes impacted by September 11, 2001 will still be a concern during the next decennial census in 2010. The Census Bureau should continue to regularly conduct surveys to assess public attitudes, although not too frequently, as Singer et al., (2001) notes that surveys typically show small year-to-year changes.

4.2. Behavioral Responses to Census 2000

4.2.1. Behavioral Predictors

Examination of the actual census form returns of SPA2000 respondents reiterated the importance of considering the public's privacy concerns, views on the Census Bureau's confidentiality practices, approval of data sharing, and willingness to provide one's SSN. Each of these attitudinal items was a reliable predictor of whether or not respondents returned their Census 2000 forms (and mostly in a negative direction). It was further revealed that nonwhite respondents were less likely to return their census forms. Future research may want to assess potential explanations behind these predictive relationships in order to improve future response rates. Although reliable, these predictors were shown to account for only a small portion of the variance in census mail returns. Therefore, it would also be beneficial to examine other possible response barriers that may interfere with census response rates.

Similarly, SPA2000 respondents who had greater concerns about privacy and were less favorable towards data sharing and providing their SSNs, were less likely to provide matchable mailing addresses. In fact, among the 1999 and 2000 samples, only 60 percent provided addresses that could be successfully matched. Singer et al., (2001) suggests that the inability to assess the relationship between attitudes and behavior among the other 40 percent of the sample serves to underline the extent to which concerns about privacy negatively affect willingness to cooperate with the decennial census. Again, the need for the Census to further examine and respond to the public's concerns about privacy seems important.

4.2.2. The Effect of SSN Request on Behavior

Based upon respondents' reported attitudes in the SPA2000 survey (Singer et al., 2001), the inclusion of the SSN request with the actual Census 2000 materials was expected to reduce the mail response rates and item nonresponse rates. Results of the SSN-Notification study (Guarino et al., 2001) supported these expectations, yet not to the extent originally predicted. Furthermore, the SSN request for all household members was associated with more missing data, yet there was no effect revealed for Person 1. However, collectively, any request for SSN would seem to increase the odds of having at least some missing data on the form (Guarino et al., 2001).

The validity of respondents' provided SSNs was high, with a rate of 95 percent (Brudvig, 2002). In fact, the high validity rate of Person 1 stayed the same whether the SSN request was for Person 1 only or for all household members. For the rest of the household members, patterns of validation rates did steadily decrease by person. Yet, they too, were fairly high rates, with the lowest rate of Person 6 being 80 percent. Brudvig (2002) concluded that basically, respondents who choose to report a SSN are most likely to report an accurate one.

Although the two panel studies did find behavioral responses that complimented the earlier attitudes about data sharing and SSN requests revealed in SPA2000 (Singer et al., 2001), the effects of SSN requests and notification of administrative records use were not as great as predicted by the SPA2000 findings. Taken together, the results of SPAN's survey and panel components (conducted during a decennial census) show the same pattern of findings revealed by earlier, mid-cycle studies, in which focus groups indicated negative reactions to a SSN

request and then a behavioral study that actually requested SSNs demonstrated a smaller-than-anticipated decrease in mail response rates (Dillman, Treat, & Clark, 1994; Singer & Miller, 1992). Similarly, an earlier study also found reported SSNs to be highly accurate (Bates, 1992). Therefore, it appears that public attitudes on these matters do correspond with related response behaviors, but not to the extent that one might expect.

It is important to note, however, that requests made on a nationwide basis could be very different (Brudvig, 2002; Guarino et al., 2001). For instance, the panel studies did not target non-English speaking households, that would possibly be a part of the nonwhite group that revealed less willingness to provide SSNs and lower response rates (Singer et al., 2001). Guarino et al., (2001) did not find any differences among demographic groups (nor by coverage areas), while a planned analysis of characteristics of households that provide and do not provide SSN information was not undertaken due to decennial resource considerations (Brudvig, 2002). Further studies that examine potential racial or ethnical differences (and subsequently different coverage areas) need to be performed before a final determination can be made with respect to the effect of SSN requests upon response behaviors to the decennial census.

Furthermore, when generalizing the results of the SPA2000 survey and the earlier focus groups (Bates, 1992), from which the panel studies' predictions are based, the exposure to greater public opinion is a crucial consideration. In the focus groups, participants were exposed to others' views and opinions, while participants in the SPA2000 (and the two panel studies) were not. This is a critical difference because people's attitudes and even behavior, have a greater likelihood of being influenced by those of other individuals in a more public, social context (Eagley & Chaiken, 1993). There was no formal publicity about including SSN requests on census forms at the time people responded to the SPA2000 survey or completed the Census 2000 forms used in the panel studies. Therefore, the likelihood of others' opinions impacting respondents' individual attitudes and behavior was reduced. However, if a nationwide request for SSNs occurred, the Census Bureau would have to anticipate the potential impact that larger public opinion would have upon individuals' attitudes and response behavior. Results of the focus group studies and the SPA2000 may have revealed similar disapproval among respondents, yet the greater public debate and discussion that would occur with a nationwide SSN request would create a public context filled with dominating opinions and perspectives that could possibly influence more individual respondents' attitudes and subsequent response behavior.

Another issue concerns the request of SSNs for all household members. Nonresponses to the SSN request could be due to other reasons besides unwillingness. For example, nonresponses for Persons 2 through 6 may be the result of lack of availability or the inaccessibility of that information to the person completing the census form (Brudvig, 2002). There is also the possibility that children in the household do not have SSNs to report. Future research may want to examine these other factors that may contribute to nonresponse rates, with the ultimate goal of finding ways to reduce or resolve these barriers that may interfere with the extent to which matching SSNs from census data to administrative records can occur (Brudvig, 2002).

4.2.3. The Effect of Notification on Behavior

The effects of notification on census response rates, form completeness, and the validity of provided SSNs were not what was originally expected. First, panels receiving either the general or the specific notification method (taken together) *did* show reduced mail response rates. Yet, the anticipated stronger effect of specific notification over general notification was not demonstrated. Nor could it be concluded that inclusion of notification with a SSN request discourages mail responses, as compared to notification alone.

As well, notification did not affect form completeness, whether the two notification types were grouped together or examined separately. Contrary to the original prediction, results indicated that there were lower responses to the SSN item for Person 1 when the SSN request was made *without* notification. This occurred regardless of the number of SSNs requested (Person 1 only versus all household members) and regardless of the type of notification, which also showed no individual effects upon respondents' form completeness. Finally, notification had no effect upon the validity of respondents' provided SSNs. With no existing empirical data, the two SPAN panel studies were the first to empirically examine the effect of notification upon these factors.

The panel study results do not completely correspond with the results of the SPA2000 survey indicating predictive relationships between attitudes on data sharing and subsequent response behavior. Nevertheless, these findings do raise some conceptual and methodological issues for future research to pursue. First, there is the finding of lower responses to the SSN item for Person 1 when notification was not included with the SSN request. Guarino et al., (2001) suggests that people may have viewed the notification as justification for the SSN request, resulting in higher item response rates among those who received notification. Based upon this finding, if SSNs are to be requested on future decennial censuses, then notification should be included with the request (Guarino et al., 2001).

In addition, future research needs to re-evaluate the effect of notification upon response rates using a different perspective. More specifically, it is possible that when people are informed of the purpose behind a request, then they are *more* likely to respond to the request versus when they have no information and have to rely upon their own suspicions. This perspective corresponds with findings in the area of risk management which show that the more one knows about the nature of the risk, the less anxiety-provoking it is (Slovic, 1987).

This is also consistent with the unconfirmed hypothesis that specific notification would have a stronger (negative) effect than the general notification condition. Recall that one analysis found general notification to have a stronger effect on mail response rates, while another analysis revealed no difference in the magnitude of the effect between general and specific notification. The general notification condition may have led to higher suspicions of exactly which agencies are being referred to than the specific notification condition that actually listed them. In turn, people were less responsive or willing to actually report their SSN without more details. Furthermore, in the SSN-Validation study (Brudvig, 2002), Panel 4, which received requests for all household members' SSNs and specific notification, appeared to show a general pattern of slightly higher validation rates across reported SSNs for many of the household members compared to the other panels that requested SSNs for all household members and received either

no notification or general notification. With the growing requests for personal information in today's world (and the related concerns of fraud and misuse), people may be less willing to provide such information without specific details of how it will be used – or by whom. This perspective on the effect of notification highly coincides with the Census Bureau's need to alleviate the public's increasing privacy concerns and provide confidentiality assurances in order to enhance future census data collections.

There are also some methodological concerns to consider. First, review of the SSN request in the cover letter (see Table 1), raises the concern of whether the two "SSN request-only" panels did not also receive the general notification treatment in the statement preceding the SSN request in their cover letter. This is a concern that can ultimately affect the interpretation of the study's results. Another issue pertains to respondents' actual exposure to the treatment conditions of SSN request and notification. Some respondents may not have read their cover letters, resulting in no way to ascertain a direct causal relationship between the treatment conditions and their behavior (Guarino et al., 2001). Yet due to random assignment of sample cases to the treatment conditions, it can be assumed that there was no differential confounding motivational effects across the treatment conditions. Future research may want to explore methodological procedures that address these concerns.

4.3. Comments on Census Publicity

Two SPA 2000 survey findings related to census publicity need to be mentioned. First, the Census 2000 publicity did not appear to positively affect respondents' attitudes toward privacy, confidentiality, and data sharing. Given the relationship between these attitudes and census response rates, if the Census Bureau decides to take measures to expand administrative records use and to request SSNs on future decennial censuses, then future census publicity efforts should be designed to address these attitudes. This is especially true if there is greater public airing of privacy concerns in response to these changes in the census methodology (Guarino et al., 2001). On a related note, people who reported being exposed to only positive media about the census also indicated more trust in the Census Bureau's confidentiality assurances and greater willingness to provide their SSNs. Future research may want to further examine the relationship between positive census publicity and public attitudes; testing causality, or the effect of publicity exposure upon these attitudes that impact census response behavior.

It is also useful to note that the group exposed to only negative census media demonstrated similar attitudes to those exposed to *both* positive and negative media, whereas more attitudinal differences were shown between the group that reported exposure to both types of media and the group reporting only positive census media exposure. Is it possible that exposure to negative census media has the effect of inoculating public attitudes against positive census media, or does census publicity merely need to be more carefully adjusted to meet public concerns? Obviously, the Census Bureau cannot control negative press about the census from other sources, yet it can control what its own publicity campaign includes or focuses upon. The development of publicity techniques to counteract negative press would be helpful.

4.4. Recommendations

The Census Bureau is faced with an interesting dilemma. On the one hand, there is the goal to respond to the public's request for an easier-to-use questionnaire (U.S. Census Bureau, 2002). Expanding the use of administrative records during decennial censuses and requesting SSNs to facilitate data sharing is one possible method that could reduce the burden of census respondents and reduce some of the costs associated with the census. However, these new techniques do not seem to meet the approval of respondents with concerns about privacy and confidentiality issues – attitudes that predict response behavior. The SPA2000 survey results further indicated an increase in the number of people who did not favor data sharing among agencies between 1999 and 2000, with a decline in the proportion who approved of data sharing specifically for the purpose of eliminating the short form census.

The question then becomes: Is it better to continue census data collection as it stands now, or to include SSN requests and the use of administrative records, and risk heightened views of the census as a privacy invasion and higher census nonresponse rates? Around 60 percent of SPA2000 respondents in 1999 and 2000 reported that they did not believe the benefits of saving time and money outweighed the loss of privacy. Further, cost implications are not fully known if SSN requests result in lower mail returns and higher item nonresponse rates that require more follow-up procedures (Brudvig, 2002; Guarino et al., 2001). Based upon the SPAN Experiment results, the following recommendations are made:

- ▶ Conduct research that tests more effective ways of communicating the Census Bureau's confidentiality practices to the general public (Singer et al., 2001).
- ▶ Conduct qualitative research on impediments to trust in the Census Bureau (and in the government more generally), and on ways in which feelings of trust might be enhanced via publicity efforts or other forms of interaction with the public (Singer et al., 2001).
- ▶ Develop research to identify and alleviate privacy concerns that may influence or predict lower response rates with respect to the decennial census.
- ▶ Research is needed to assess the impact of the events on September 11, 2001 (and following) upon public attitudes concerning privacy issues, data sharing, and the usage of SSNs as identifiers for the census (Brudvig, 2002). At the same time, it is unknown as to whether any possible current attitudinal changes will still apply around 2010. Singer et al., (2001) suggests that the monitoring of attitudinal trends should not be conducted too frequently, as studies show small year-to-year changes.
- ▶ Conduct qualitative research with members of targeted population segments that demonstrated lower mail response rates, less acceptance of data-sharing, or less willingness to provide their SSNs, to better understand their perspectives and reservations (e.g., nonwhites, females). Subsequently, develop and test new publicity

efforts or strategies that address the concerns of these population segments – especially those that tend to compose the low coverage census areas (LCA).

- ▶ Design and conduct research to identify and reduce other, currently unknown, barriers to census responses, as the predictors shown in SPA2000 only accounted for a small portion of the variance in respondents' Census 2000 mail returns (Singer et al., 2001). Barriers of other response modes (e.g., telephone, interviews) could also be explored.
- ▶ Conduct more research on the effect of SSN requests upon response behavior that further examines: the characteristics of households that provide and do not provide SSNs, the accuracy of households reconstructed from administrative records, and the effect of having and not having the SSN in household reconstruction. In conjunction with the accuracy of SSNs, these analyses would provide indicators of the quality of data and the usefulness of collecting SSNs in future surveys and censuses (Brudvig, 2002).
- ▶ Perform research that focuses upon the SSN requests of all household members to identify factors other than attitudes, which may contribute to the nonresponse rates of SSN requests (e.g., more practical barriers, like the inaccessibility of others' SSN information). New methods and techniques can be explored that improve the response rates of SSN requests for ALL household members and that recognize issues, such as the lack of a SSN among some children (Brudvig, 2002).
- ▶ Design research to further examine the effect of general and specific notification upon response behavior by considering other interpretations of how they may be viewed (e.g., justifications), and by developing new methods that further establish the relationship between notification treatment conditions and behavior. Future research also needs to assess if providing information on the use of SSN does not markedly decrease response rates and improves validation rates, as this may change future censuses.
- ▶ Develop research to examine the cumulative nonresponse to SSN requests (i.e., unit nonresponse, SSN item nonresponse, and SSN invalid rates) to obtain an indicator of the extent to which matching to administrative records could take place (Brudvig, 2002).
- ▶ Conduct a cost/benefit analysis that fully assesses all implications, should the Census Bureau consider asking census respondents for SSNs in future decennial censuses (Brudvig, 2002). Future research could also document the use of other identifiers besides SSNs, that are used to link files with fewer costs (Brudvig, 2002).

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References

- Bates, N. "Revised Item Nonresponse Results for Social Security Number from the Simplified Questionnaire Test (SQT)," Memorandum to Robert D. Tortora & Susan M. Miskura, June 18, 1992.
- Brudvig, L. "Analysis of the Social Security Number - Validation Component of the Social Security Number, Privacy Attitudes, and Notification Experiment," Census 2000 Testing, Experimentation, and Evaluation Program, September 27, 2002.
- Census Privacy Act of 2000, H.R. 4085, 106th Congress., 2nd Session, March 23, 2000.
- Decennial Media Relations Office, "'Well Done America!' – Nation Achieves 67 Percent Response Rate in Census 2000, Two Points Higher Than 1990," September 21, 2000.
- Dillman, D.A., Treat, J.B., & Clark, J.R. "Influence of 13 Design Factors on Completion Rates to Decennial Census Questionnaires," 1994 Annual Research Conference and CASIC Technologies Interchange Proceedings, Rosslyn, Virginia, March 1994.
- Dillman, D.A., Sinclair, M., & Clark, J. "Effects of Questionnaire Length, Respondent-friendly Design, and A Difficult Question on Response Rates for Occupant-addressed Census Mail Surveys." *Public Opinion Quarterly*, 1993, Vol. 57, No. 3, pp. 289-304.
- Eagley, A.H., & Chaiken, S. The Psychology of Attitudes. Fort Worth, Texas: Harcourt Brace College Publishers, 1993.
- Gates, G.W., & Bolton, D. "Privacy Research Involving Expanded Statistical Uses of Administrative Record," *Proceedings of the Section on Government Statistics and Section on Social Sciences*, 1998.
- Guarino, J.A., Hill, J.M., & Woltman, H.F. "Analysis of the Social Security Number (SSN) Notification Component of the Social Security Number (SSN), Privacy Attitudes, and Notification Experiment (SPAN)," Census Bureau report, Testing and Experimentation Program, November 13, 2001.
- Kerwin, J., & Edwards, S. "The 1996 Study of Public Attitudes toward Administrative Record Use: Final Report," Report to U.S. Census Bureau under Contract 50-YABC-2-66025 (Deborah Bolton, Contract Manager), 1996.

- Kulka, R.A., Holt, N.A., Carter, W., & Dowd, K.L. "Self-Reports of Time Pressures, Concerns for Privacy and Participation in the 1990 Mail Census," *Proceedings of the Annual Research Conference*, 1991.
- Leslie, T.F., & Treat, J.B. "Results from the Verification of Social Security Numbers Collected During the 1992 National Content Test I." U.S. Census Bureau; Decennial Management Division and Decennial Statistical Studies Division. December 14, 1994.
- Neugebauer, R. "Census 2000 Experimentation Program Master Plan: The Social Security Number (SSN), Privacy Attitudes, and Notification Experiment," Census Bureau, Planning and Evaluation Division, November 5, 1999.
- Singer, E., Hoewyk, J., Tourangeau, R., Steiger, D., Montgomery, M., & Montgomery, R. "Final Report of the 1999-2000 Surveys of Privacy Attitudes," Census 2000 Testing and Experimentation Program, December 10, 2001.
- Singer E., & Miller, E. "Reactions to the Use of Administrative Records: Results of Focus Group Discussions," Census Bureau report, Center for Survey Methods Research, August 24, 1992.
- Singer, E., Mathiowetz, N.A., & Couper, M. "The Impact of Privacy and Confidentiality Concerns on Survey Participation: The Case of the 1990 U.S. Census," *Public Opinion Quarterly*, 1993, Vol. 57, No. 3, pp. 465-482.
- Singer, E., & Presser, S. "Public Attitudes toward Data Sharing by Federal Agencies." Paper presented at the Census Bureau Annual Research Conference, Washington DC, 1997.
- Singer, E., Presser, S., & Van Hoewyk, J. "Report to the Census Bureau on Findings from the 1996 Survey of Public Opinion about the Use of Administrative Records in the Census." Report to the U.S. Census Bureau under Contract 50-YABC-2-66025 (Deborah Bolton, Contract Manager).
- Slovic, Paul. "Perception of Risk." *Science*, New Series, 236 (4799), pp. 280-285.
- Statistical Administrative Records System. StARS SSN Search and Verification Programming Specification. Social Security Number Verification Against the Enhanced Census Numident. 2nd Draft, Cat. Number: STAR0004-00. December 20, 2001 (unpublished).
- U.S. Census Bureau, "U.S. Census Bureau Strategic Plan FY 2004-2008," July 2002.

Article 1. Mapping Questions of the SPA2000 Survey Instrument.

Item Notes	SPA 2000 (1999/2000)	1996 SPARU	1995 JPSM
census importance	Question #1	Question #1	Question #1
sex	2	2	2
Hispanic origin, per 2000 phrasing	3, 3a	3	3
race, per 2000 phrasing	4, 5	4	4
year born	6	5	5
{marital status dropped per 2000}	—	6	6
data confidentiality protection by Census Bureau	7a1, 7b1, 7c1, 7d1, 7e1, 7a2, 7b2, 7c2, 7d2, 7e2	----	----
gov. agencies can get census info	7a3, 7b3, 7a4, 7b4	7_1, 7_2, 7_3, 7_4	7
protect-sureness, frequency, bothered	7c3, 7d3, 7e3, 7f3	7a, 7b, 7c, 7d	7a, 7b, 7c, 7d
get info-sureness, frequency, bothered	7c4, 7d4, 7e4, 7f4	7a1, 7b1, 7c1, 7d1	----
knowledge of how census is used	8, 8a	8	10
undercount	9a, 9a1, 9b, 9b1	9a, 9b	11a, 11b
record use, agency 1, undercount	10	10	12a
strongly feel	11	11	12a1
record use, agency 2	12	12	12b
record use, agency 3	13	13	12c
do away with census	14	14	13
cost less vs. accurate count	15a, 15b	15a, 15b	14a, 14b
oppositions (open-ended)	15c	15c	14c
census, privacy invasion	16	16	15
list of invasive questions	16a	16a	15a
importance of short form	17a, 17b	17a, 17b	16a, 16b
knowledge of long form	18	18	17
agency 1, long form data	19	19	18
agency 2, long form data	19a	19a	18a
agency 3, long form data	20	20	19

* Taken and modified from Neugebauer, 1999.

Article 1. Mapping Questions of the SPA2000 Survey Instrument. *(continued...)*

Item Notes	SPA2000 (1999/2000)	1996 SPARU	1995 JPSM
Willingness to provide SSN	21	21	----
NEW QUESTION, half sample split, probability to answer census [past-tense wording in post-measurement]	22a, 22a1, 22b, 22b1	----	----
undercount seriousness-community/cities	23a, 23b	----	20b
trust Census Bureau not to give info	24a, 24a1	22a, 22a1	----
trust Census Bureau to keep confidential	24b, 24b1	22b, 22b1	----
data sharing	25 [same as 23a, 23b dropped]	23a, 23b	----
privacy worry	26	----	24
privacy invasion victim	27	----	25
phone tapped	28	----	26
little say in government-agree/disagree	29a	24a	27f
public officials care-agree/disagree (a/d)	29b	24b	27g
right to privacy protected - a/d	29c	24c	27a
lost control of personal info - a/d	29d	24d	27b
strictly regulate computers - a/d	29e	----	27d
gov. knows more about me - a/d	29f	----	27e
cooperate with Census	29g	----	27h
trust “Washington”	30	25	29
confidence	31	----	28
FBI	32	----	Item D
illegal aliens	33	----	Item D
census data used against people	34	----	Item D
education	D1	26	37
income	D2	27	38
income	D3 to D7	27a to 27e	38a to 38e
address	D8	28	Zip Code

* Taken and slightly modified from Neugebauer, 1999.

Article 2. Survey Items, Response Categories, and Weighted Ns Across Four Public Surveys.

Attitude Survey Items & Response Categories*	N (weighted)			
	1995	1996	1999	2000
Knowledge and Awareness of Census:				
How important do you think it is to count the people in the U.S.? (<i>Extremely, Very, Somewhat, or Not Too Important</i>)	1415	1207	1663	1962
The census is used to decide how many representatives each state has in Congress...[and] how much money communities get from the government. Have you heard about either of these uses of the Census? (<i>Yes or No</i>)	1434	1207	1672	1967
(A) Have you heard about some communities getting fewer representatives or less money because they were undercounted? (<i>Yes or No</i>)	765	601	799	967
(B) Have you heard about big cities and cities with large minority populations getting fewer representatives or less money because they were under-counted? (<i>Yes or No</i>)	652	603	869	982
Please tell me if you strongly agree, somewhat agree, somewhat disagree, or strongly disagree. Everyone has a responsibility to cooperate with the Census?	1426	na	1666	1969
Beliefs About Confidentiality:				
(A) Do you think other government agencies, outside the Census Bureau, can or cannot get people's names and addresses along with their answers to the census, or are you not sure? (<i>Other Agencies Can Get Names, Other Agencies Cannot Get Names, or Not Sure</i>)	1443	317	830	989
How sure are you that other government agencies cannot get people's names and addresses along with their answers to the census: very sure, fairly sure, not too sure, or not sure at all?*	130	na	74	109
(B) Do you think the Census Bureau does or does not protect the confidentiality of this information, or are you not sure? (<i>Does, Does Not, or Not Sure</i>)	na	289	827	975
How sure are you that the Census Bureau protects the confidentiality of this information: very sure, fairly sure, not too sure, or not sure at all?*	na	186	130	164
(A) As far as you know, is the Census Bureau forbidden by law from giving other government agencies information identified by name or address? (<i>Yes, No, or Don't Know</i>)	na	579	762	973
(B) As far as you know, is the Census Bureau required by law to keep information confidential? (<i>Yes, No, or Don't Know</i>)	na	636	912	1004

* For all items, respondents had the option of responding with "Don't Know" or refusing to respond. In some cases, the surveys had two question versions on the same issue and utilized a half sample split. Survey respondents received only one of the two versions. Items noted as (A) and (B) indicate the two question versions.

** These items were only asked of respondents who indicated that other agencies can get names (Version A) or that the Census Bureau does protect confidentiality (Version B).

Article 2. Survey Items, Response Categories, and Weighted Ns Across Four Public Surveys. *(continued)*

N (weighted)				
Attitude Survey Items & Response Categories*	1995	1996	1999	2000
Data Sharing and SSN Requests:				
(A) How much would it bother you if another government agency, outside the Census Bureau, got your name and address along with your answers to the census? Would it bother you a lot, some, a little, or not at all? *	1367	587	548	634
(B) How much would it bother you if your answers to the census were not kept confidential? Would it bother you a lot, some, a little, or not at all?*	na	580	547	656
Would you favor or oppose the Census Bureau getting everyone's name, address, age, sex, race [and marital status] from the records of other government agencies, so no one would have to fill out a census form? <i>(Favor or Oppose)</i>	1338	1137	1629	1915
Now I will ask you about a proposal to fix the undercount. It involves using records from a number of government agencies to identify people who are missed in the Census....Would you favor or oppose [agency's name] giving the Census Bureau the name, address, age and sex of all the people for whom they have information in their records? <i>(Favor or Oppose)</i> **	1269	1106	1568	1843
Combining information from agencies would mean that everyone could fill out the short form instead of some people having to fill out the longer form. To make this possible, would you favor or oppose the IRS giving the Census Bureau information on things like people's jobs and income, along with their name and address? <i>(Favor or Oppose)</i> ***	1365	1178	1645	1924
The Census Bureau is considering ways to combine information from Federal, state, and local agencies to reduce the costs of trying to count every person in this country. Access to Social Security numbers makes it easier to do this. If the census form asked for your Social Security number, would you be willing to provide it? <i>(Yes or No)</i>	na	1172	1641	1937
Trust and Privacy Concerns:				
Do you trust the Census Bureau to keep information confidential? <i>(Yes/No)</i> ****	na	464	957	1197
How much do you trust the government in Washington to do what is right? <i>(Just about Always, Most of the Time, Some of the Time, Almost Never)</i>	1425	1205	1666	1970
In general, how worried would you say you are about your personal privacy? <i>(Very, Somewhat, Not Very, or Not At All Worried)</i>	~1430	~1170	~1670	~1970
Please tell me if you strongly agree, somewhat agree, somewhat disagree, or strongly disagree. People have lost all control over how personal information about them is used?	~1430	~1170	~1670	~1970
Do you feel it is an invasion of your privacy for the Census Bureau to ask your age, race, sex, Hispanic origin, and marital status along with your name and address? <i>(Yes or No)</i>	1429	1201	1660	1966

* For all items, respondents had the option of responding with "Don't Know" or refusing to respond. In some cases, the surveys had two question versions on the same issue and utilized a half sample split. Survey respondents received only one of the two versions. Items noted as (A) and (B) indicate the two question versions.

** In all four years, all respondents were asked about the Social Security Administration and the Internal Revenue Service. The third agency varied by year: 1995, Immigration and Naturalization Service; 1996, Food Stamp Office, 1999 and 2000, "agencies providing public housing assistance." Reported weighted Ns reflect the number of respondents who answered all three items with "favor" or "oppose." Less than 10 percent refused to answer or stated "Don't Know" to one of more of the three items in 1996, 1999, and 2000. In 1995, it was 12 percent.

*** All respondents were asked this question twice, in reference to the IRS and another agency, which varied by year. Therefore, comparisons could only be performed to item responses to the question including the IRS.

**** This item was only asked to those who correctly knew that the Census Bureau is forbidden by law from giving other

agencies information or is required by law to keep information confidential (depending on question version received).

Table 1. Experimental Treatments Presented in the Census 2000 Cover Letters.

(1) SSN-Request:

Because providing the SSN was voluntary, the cover letter for the short form panels with the SSN request contained an additional statement:

To improve the quality of census statistics, the Census Bureau sometimes uses records from other government agencies. For that purpose, we are asking for your social security number; however, providing your social security number is voluntary.

(2) General Notification:

The general notification mentioned the Census Bureau's possible use of statistical data from other Federal agencies:

To improve the quality of census statistics, the Census Bureau sometimes uses records from other government agencies. Using other agencies' records helps make the census more complete. By making better use of government records that already exist, the Census Bureau may be able to ask you fewer questions in the census.

(3) Specific Notification:

The specific notification mentioned the Census Bureau's possible use of statistical data from other Federal agencies, and further named the Federal agencies:

To improve the quality of census statistics, the Census Bureau sometimes uses records from other government agencies, such as the Social Security Administration, the Internal Revenue Service, or agencies providing public housing assistance. Using other agencies' records helps make the census more complete. By making better use of government records that already exist, the Census Bureau may be able to ask you fewer questions in the census.

Taken directly from Guarino et al., 2001.

Table 2. Changes in Public Attitudes From 1995 to 2000*.

Attitude/Belief	1995	1996	1999	2000
Knowledge and Awareness of Census:				
Important to count people in the census	72.0%	74.4%	80.7%	86.1%
Aware of census uses	46.7%	51.0%	51.7%	70.6%
Aware of undercount in “some communities”	36.2%	37.9%	41.2%	48.7%
Aware of undercount in “big cities”	44.6%	42.5%	43.8%	56.7%
Obligation to cooperate with census	91.0%	na	86.9%	92.4%
<i>Strongly Agree</i>	53.9%	na	50.4%	66.4%
<i>Somewhat Agree</i>	37.1%	na	36.5%	26.0%
Beliefs About Confidentiality:				
Other agencies <i>cannot</i> get census data	9.2%	6.1%	12.2%	17.3%
<i>Very sure other agencies cannot get census data</i>	34.1%	na	37.6%	23.0%
Census Bureau protects data confidentiality	na	12.9%	22.8%	25.1%
<i>Very sure Census Bureau protects data confidentiality</i>	na	19.5%	31.5%	30.4%
Census Bureau is forbidden by law from sharing data	na	28.3%	43.3%	48.9%
<i>No, Not Forbidden</i>	na	17.1%	29.7%	19.0%
Census Bureau is required to keep data confidential	na	51.1%	71.3%	76.0%
Data Sharing and SSN Requests:				
Bothered a lot if census responses are shared	36.8%	38.7%	45.4%	45.6%
Bothered a lot if Census Bureau did not protect confidentiality	na	36.6%	46.4%	49.6%
Favor a “records only” census to eliminate short form	59.0%	54.7%	46.5%	42.3%
Favor a “records only” census to fix the undercount	62.6%	58.7%	43.8%	44.3%
Favor a “records only” census to eliminate long form	52.2%	50.8%	44.3%	42.9%
Willingness to share SSN	na	68.3%	55.1%	55.9%
Trust and Privacy Concerns:				
Trust Census Bureau to keep data confidential	na	66.7%	69.3%	67.8%
Trust in Government (<i>always or most of the time</i>)	24.5%	21.3%	29.0%	30.2%
Very worried about privacy	22.0%	na	25.7%	25.0%
Strong belief one has lost control over personal information	40.3%	44.2%	42.1%	44.1%
Census is an invasion of privacy	23.5%	19.0%	23.0%	20.9%

* Percentages indicate the proportion of respondents who adhered to the listed beliefs/attitudes.

** Response categories of “Don’t Know” or “Not Sure” were included in percentage calculations only when they represented more than 10 percent of the responses. This only occurred with the “Beliefs about Confidentiality” items. For the remaining presented items, less than 7.5 percent of the samples indicated “Don’t Know” or refused (for details, see Singer et al., 2001).

Tables 3a-b. Effects of Different Publicity Exposures Upon Survey Responses in 2000.

Table 3a. Effects of Exposure to Positive and/or Negative Publicity on Responses.

Belief/Attitude Item (dependent variable)	<u>Positive & Negative</u>		<u>Positive Only</u>		<u>Negative Only</u>	
	Beta	(SE)	Beta	(SE)	Beta	(SE)
Knowledge	1.50***	(0.15)	1.03***	(0.14)	0.72***	(0.15)
Importance	0.16*	(0.08)	0.38***	(0.08)		
Privacy Index	0.49**	(0.20)	-0.42**	(0.18)		
Census as Invasion of Privacy	0.29*	(0.17)				
Census Misused	-0.16**	(0.07)	-0.19***	(0.07)		
Census Protects Data	0.53**	(0.24)	0.61***	(0.22)		
Agencies Cannot Get Data	0.56**	(0.26)				
Share Data to Reduce Undercount			0.25*	(0.14)		
Trust Census Bureau			0.44***	(0.16)		
Trust Government			0.27***	(0.08)		
Willingness to Provide SSN	-0.28**	(0.14)				
Cooperate with Census	0.55***	(0.15)	0.50***	(0.14)		

Note: "No Exposure" category is omitted from table and only statistically significant findings are reported.

* $p < .10$ ** $p < .05$ *** $p < .01$

Table 3b. Effects of Exposure to Positive or Negative Publicity Only Vs. Both Publicity Types.

Belief/Attitude Item (dependent variable)	<u>Positive Only Exposure</u>		<u>Negative Only Exposure</u>	
	Beta	(SE)	Beta	(SE)
Knowledge	-0.47***	(0.15)	-0.78***	(0.16)
Importance	0.23***	(0.08)		
Privacy Index	-0.91***	(0.20)		
Census as Invasion of Privacy	-0.53***	(0.18)		
Census Protects Data			-0.55**	(0.26)
Agencies Cannot Get Data			-0.60**	(0.30)
Share Data to Reduce Undercount	0.33**	(0.15)		
Trust Census Bureau	0.45***	(0.17)		
Trust Government	-0.28***	(0.08)		
Willingness to Provide SSN	0.46***	(0.14)		
Cooperate with Census			-0.38**	(0.17)

Note: The two exposure categories above are compared to the "Both Positive and Negative Exposure" category.

Only statistically significant findings are reported. * $p < .10$ ** $p < .05$ *** $p < .01$

Table 4a-b: Demographic and Attitudinal Predictors of Census Mail Returns and Matches.

Table 4a. Demographic and Attitudinal Predictors of Census Mail Returns in 1999 and 2000.

Variable	<u>1999</u>		<u>2000</u>	
	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error
Form Type (long)	-0.81***	0.22	-0.57***	0.19
Female	0.46**	0.19		
Age (logged)	0.77***	0.27	1.10***	0.24
Nonwhite			-0.65***	0.21
Education	0.22**	0.10	0.24***	0.09
Privacy Index			-0.06*	0.04
Census Misused	0.16*	0.09	-0.22***	0.08
Share to Eliminate Census			-0.36**	0.18
Willingness to Give SSN	0.34*	0.20		
Income Imputed	0.68**	0.35		

Note: Only statistically significant results are reported.

* $p = .10$

** $p < .05$

*** $p < .01$

Table 4b. Demographic/Attitudinal Predictors of Match Between Survey and Census Records.

Variable	<u>1999</u>		<u>2000</u>	
	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error
Intercept	-1.83**	0.74		
Age (logged)	0.43***	0.15		
Hispanic			-0.42**	0.17
Income			0.11***	0.04
Invasion of Privacy	-0.60***	0.13	-0.23*	0.13
Share to Reduce Undercount	0.26**	0.12	0.43***	0.11
Share to Eliminate Long Form	0.35***	0.12		
Willingness to Give SSN	0.27**	0.12	0.25**	0.11
Trust Government			0.07*	0.04
Income Imputed	-0.57***	0.15	-0.49***	0.13

Note: Only statistically significant results are reported.

* $p = .10$

** $p < .05$

*** $p < .01$

Table 5. Logistic Regression Coefficients Predicting the Log Odds of Responding to the Census (Guarino et al., 2001)

Variable	Logistic Regression Models		
	Simple Model ^a	SSN-Strata Interaction Model	Treatment Interaction Model
SSN Request: For Person 1 = 1 For Household = 1 For Person 1 or Household = 1	-.095* -.113*	-.105*	-.071 -.053
Notification: General = 1 Specific = 1	-.090* -.037	-.094* -.041	-.063 .019
Form Type: Long Form = 1	-.454*	-.454*	-.454*
Strata: High Coverage Areas = 1	.757*	.761*	.757*
Interactions: SSN Request for either * Strata General Notification * SSN for Household Specific Notification * SSN for Household		-.006	-.060 -.120*
Intercept	.429	.430	.402

Note: The Simple Model examined the effect of SSN request for one or all persons and notification on response, while controlling for strata and form length. The SSN-Strata Interaction Model examined whether the effect of the SSN request on response differed based on the subpopulation from which it was requested (i.e., HCA vs. LCA). The Treatment Interaction Model tested whether notification decreased response in the presence of a SSN request compared to notification alone (Guarino et al., 2001).

* Indicates statistical significance at $\alpha = .10$.

^a A test of the combined effect of the SSN request for all household members and Person 1 reveals that any request for SSN decreases response. Therefore, the SSN-Strata model combines these treatments.

Table 6. Logistic Regression Coefficients Predicting the Log Odds of Returning an Incomplete Census Form (Guarino et al., 2001).

Variable	Simple Model	Notification-Form Length Interaction Model
SSN Request: For Person 1 = 1 For Household = 1	.103 .201*	.107 .201*
Notification: General = 1 Specific = 1	-.019 .008	-.015 .015
Form Type: Long Form = 1	.189*	.243*
Strata: High Coverage Area = 1	-.820*	-.820*
Interactions: General Notification * Long Form Specific Notification * Short Form		-.067 -.097
Intercept	-1.333	-1.337

* Indicates statistical significance at $\alpha = .10$.

Tables 7a-b. SSN Item Nonresponse Rates and Person 1 Comparisons (Guarino et al., 2001)

Table 7a. Item Nonresponse Rates (Standard Errors) for SSN.*

Panel	Person 1	Person 2	Person 3	Person 4	Person 5	Person 6
Panel 1 (All SSNs)	15.8% (.66)	21.6% (.92)	28.6% (1.21)	28.1% (1.63)	30.9% (4.21)	29.0% (5.00)
Panel 2 (One SSN)	15.5% (.77)	n/a	n/a	n/a	n/a	n/a
Panel 3 (All SSNs, general notification)	12.6% (.78)	17.3% (.87)	28.8% (1.55)	31.1% (1.84)	34.7% (4.28)	38.0% (8.09)
Panel 4 (All SSNs, specific notification)	11.5% (.67)	15.8% (.76)	22.9% (1.61)	24.5% (2.12)	30.6% (3.56)	47.3% (6.19)

* Cases with a SSN that was less than 9 digits or had all nines or zeros were also treated as missing.

Table 7b. Multiple Comparisons of SSN Missing Rates for Person 1 By Panel.

Pairwise Comparison	Difference
Panel 1 (all SSNs) - Panel 2 (one SSN)	.3% (1.22)
Panel 1 (all SSNs) - Panel 3 (all SSNs, general notification)	3.2%* (1.07)
Panel 1 (all SSNs) - Panel 4 (all SSNs, specific notification)	4.3%* (.86)
Panel 2 (one SSN) - Panel 3 (all SSNs, general notification)	2.9%* (1.17)
Panel 2 (one SSN) - Panel 4 (all SSNs, specific notification)	4.0%* (1.02)
Panel 3 (all SSNs, general notification) - Panel 4 (all SSNs, specific notification)	1.1% (.88)

* Statistically significant when familywise $\alpha = .10$.

Table 8. Valid SSN Rates for Persons 2-6 By Panel (Brudvig, 2002).

Panel*	Person 2	Person 3	Person 4	Person 5	Person 6
All Panels	95.45%	92.90%	89.08%	87.53%	82.80%
Panel 1 (All SSNs)	95.34%	93.87%	89.82%	85.33%	84.38%
Panel 3 (All SSNs, general notification)	95.03%	91.93%	86.60%	86.46%	80.23%
Panel 4 (All SSNs, specific notification)	95.98%	93.15%	90.75%	91.07%	83.48%

** Panel 2 requested SSN for Person 1 only.*